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DESIGN INFORMATION BULLETIN

NO: 19.013 AUG 7 '58

CONVAIR REPORT NO. ZM-22-005

PAGE: 1 of 5
ENG'R.
PRE-DESIGN

MODEL 22 AIRPLANE

DATE: 6 June 1958

880 ALIGHTING GEAR TEST STAND - MODEL 22-99-12

I. INTRODUCTION:

The purpose of the Alighting Gear Test Stand (22-99-12) is to determine if the alighting gear will properly function without evidence of fatigue or excessive wear while the gear is cycled under conditions of maximum aerodynamic loading and temperature extremes. The Alighting Gear Test Stand shall consist of two separate installations as follows:

- A. Model 22 Nose Gear Test Stand
- B. Model 22 Main Gear Test Stand

II. GROUP RESPONSIBILITY:

- A. Design, erection, operation, instrumentation and maintenance of the test stand shall be the responsibility of the Dynamics Laboratories.
 - 1. The test stand shall be fabricated by the Experimental Factory, Test Laboratory Section.
- B. Each cognizant design group shall release their own ABM's and drawings for the test stand.
 - 1. Landing Gear Group shall release Drawing 22-05139, Cycle Test Stand, Main and Nose Alighting Gear. This drawing shall include all landing gear parts and adapters necessary for the operation of the test stand.
 - 2. Hydraulics Design Group shall release Drawing 22-08601, Schematic, Landing Gear Test Stand, Hydraulic. This drawing shall include all hydraulic components necessary to the operation of the test stand.
- C. Requests for task changes, after the initial test program has been approved, must be submitted by AVO or memo to the Model 22 Project Office for approval, with copies to the Landing Gear Group and Dynamics Laboratories. A new Laboratory Work Request, Form 1845, (covering task changes only) shall be processed for added tasks.

III. TEST STAND DESCRIPTION:

- A. The alighting gear installations will be supported in steel jigs using box-type construction. The jigs will be rigid compared to aircraft structure, and structural rigidity in the area of the alighting gear attachment adapters will not be simulated. Structural rigidity simulations in the jig have been excluded because major structural deflections of the aircraft in the gear attachment area are caused by wing deflections and not by gear induced loads.

C O N V A I R
A Division of General Dynamics Corporation
(San Diego)

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III. TEST STAND DESCRIPTION: (Continued)

- B. The test stand will include the items of equipment included in Convair Drawings 22-05139 and 22-08601.
- C. The test stand will include provisions for simulating the aerodynamic forces acting on the gear in the plane of gear rotation. The forces will be controlled to produce moments about the gear pivot points in accordance with the curves of Figures 1 and 2. In addition, forces will be applied to the nose gear drag brace to produce moments in accordance with Convair Report 22-05420.

IV. TEST PROCEDURE:

- A. The alighting gear will be cycled according to the following program with loads described in Figures 1 and 2 applied.
 - 1. 20,000 cycles at room temperature
 - 2. 5,000 cycles at 160°F
 - 3. 1,000 cycles at -65°F
- B. The gear will be cycled within the time limits required for the cycling of the production alighting gear system. However, in order to prevent damage to the system, initial operation of the gear will be made at a slower rate.
- C. The loading of critical members will be monitored periodically by strain gages.
- D. In order to determine the amount of wear occurring during the test, all points of possible wear will be measured with precision instruments before starting and after completing the cycle tests. Additional measurements will be made if wear is detected before completion of the tests.

V. ALIGHTING GEAR TEST STAND PROGRAM SCHEDULE:

- A. The following schedule is contingent on receipt of all test stand components by 15 August 1958.

1. Nose Landing Gear Test Stand:

Start of Construction - 1 July 1958
Test Stand Completion - 1 October 1958
Tests Start - 1 October 1958
Test Completion - 1 November 1958

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V. ALIGHTING GEAR TEST STAND PROGRAM SCHEDULE: (Continued)

2. Main Landing Gear Test Stand:

Start of Construction - 1 July 1958
Test Stand Completion - 1 November 1958
Tests Start - 1 November 1958
Test Completion - 1 December 1958

VI. TEST REPORTS:

- A. The final test report will include a history of the cycle tests and a table showing the amount of wear. Progress reports will be prepared periodically to disclose significant events in the test program. The reports will carry the number, DL 57-716, with dash numbers indicating chronological sequence.

VII. RELATED PROCEDURES:

- A. Departmental Instruction No. 269, Test Stand Procedures.

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MODEL 22 MAIN GEAR
AIR LOADS AND "G" LOADS DURING
LANDING GEAR EXTENSION AND RETRACTION

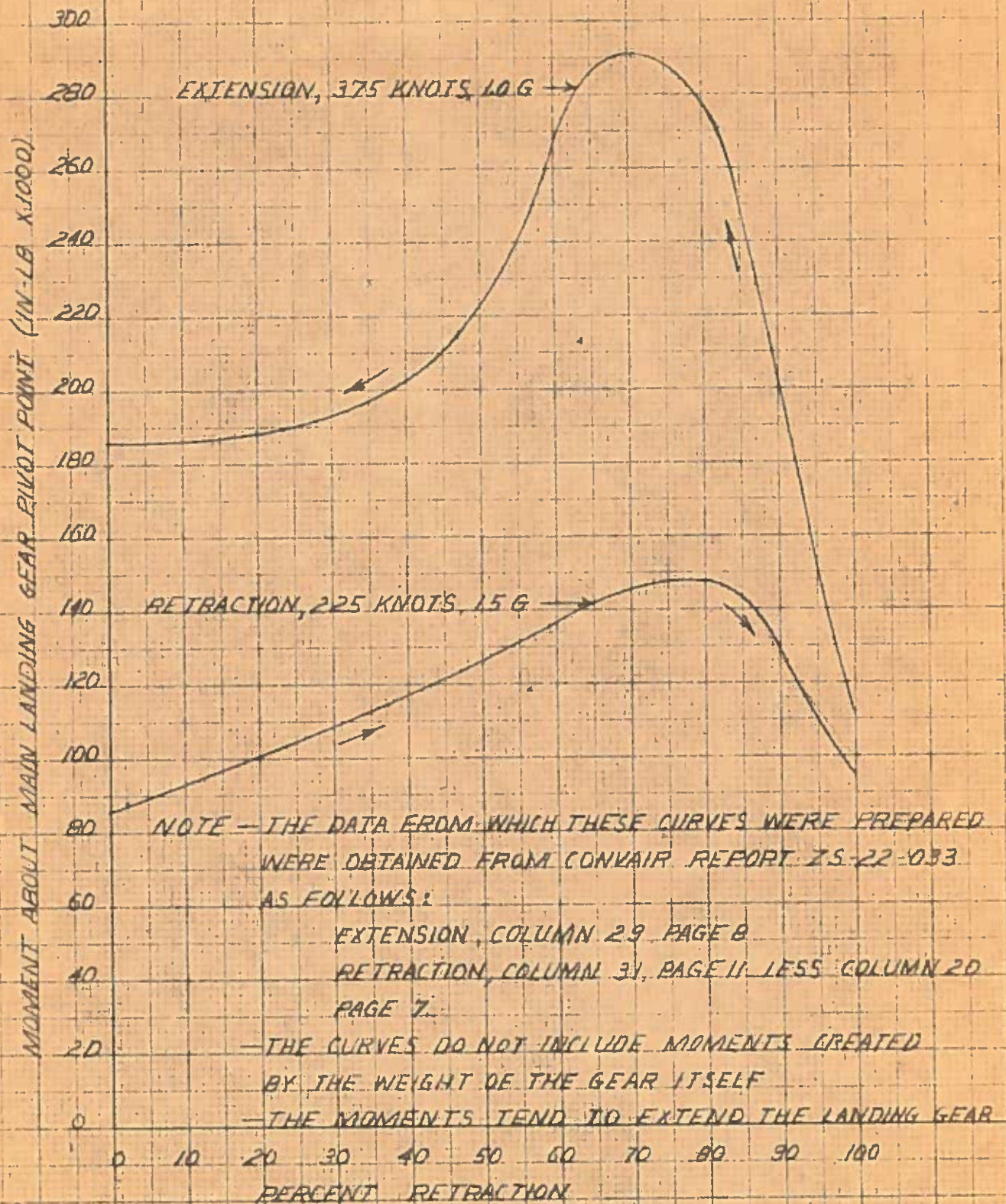


FIGURE 1